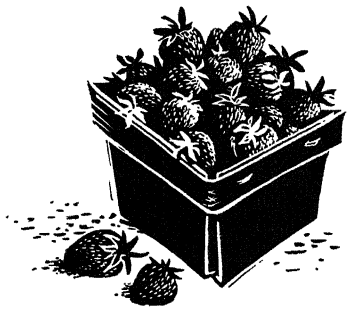
Revised April 1, 1958 Bulletin 321

how to grow

strawberries

in the home garden



Agricultural Extension Service
The Ohio State University

CONTENTS

The authors are Robert G. Hill, Jr., Associate Professor of Horticulture, the Ohio Agricultural Experiment Station, and Vernon Patterson, former Extension Horticulturist, the Ohio State University.

4-58-10M

The Ohio State University and the U. S. Department of Agriculture, cooperating. Agricultural Extension Service, W. B. Wood, director, Columbus 10, Ohio. Printed and distributed in furtherance of acts of May 8 and June 3, 1914.

How To Grow

Strawberries

In The Home Garden

By

Robert G. Hill Jr. and Vernon Patterson

An Ideal Crop for Home Gardens

Of all the fruit crops, strawberries are the best suited for the home garden. When properly managed, the plants will produce large yields of high quality berries in a limited amount of space.

Unlike many other fruit crops, strawberries do not require the grower to follow a complicated spray program. Those pesticides that may be needed can be applied with simple inexpensive equipment.

As with any gardening venture, a grower's success with strawberries depends upon careful attention to the cultural details. He may expect nearly a full quart of berries from each plant in the home garden, if he cares for it properly.

Strawberries, in addition to being an attractive and delightful desert fruit, are highly nutritious. A single portion of fresh berries will supply more than the minimum daily vitamin C requirement, as established by the United States Food and Drug Administration. Surplus berries from the garden make a welcome addition to the home freezer.

Selecting Site and Soil

Fortunately, the strawberry will grow and produce satisfactorily in a wide range of soil types, from sandy to heavy loams. Also, strawberries are not particularly sensitive to soil reaction, pH; however, they produce best on sandy loam soils with a pH of 5.8 to 6.5. If soil reaction is unknown, the local county agent can determine it. In general, strawberries can be grown on any good garden soil, preferably one amply supplied with organic matter.

The most important factors to consider in site selection are soil drainage and freedom from frost. Good production cannot be expected without good soil drainage during the entire year.

Since strawberries require cultivation, plantings on slopes are likely to wash; some plants may be buried while other are washed out of the soil. If sloping sites must be used, the rows should run across the slope. Strawberries bloom in very early spring; therefore the planting should not be located in a frost pocket.

Areas which have recently been used to grow tomatoes or potatoes or have been in sod should be avoided. Such sites are likely to contain disease and insect pests which may attack the strawberry. The selection of a suitable site is the first step toward success with strawberries.

June-Bearing Varieties

This type of strawberry is the most popular for both home garden and commercial production. They bear one crop each year in late spring. In Ohio this normally occurs in late May and June. The first crop is produced the year after planting.

Included in this group is a special class of varieties which are resistant to a fungus disease, red stele, (See page 9). Recommended varieties of this class will produce good crops of berries on sites infested with the disease. On such sites, non-resistant varieties are not recommended. These resistant varieties are of such merit that they are often grown even though the disease is not a problem.

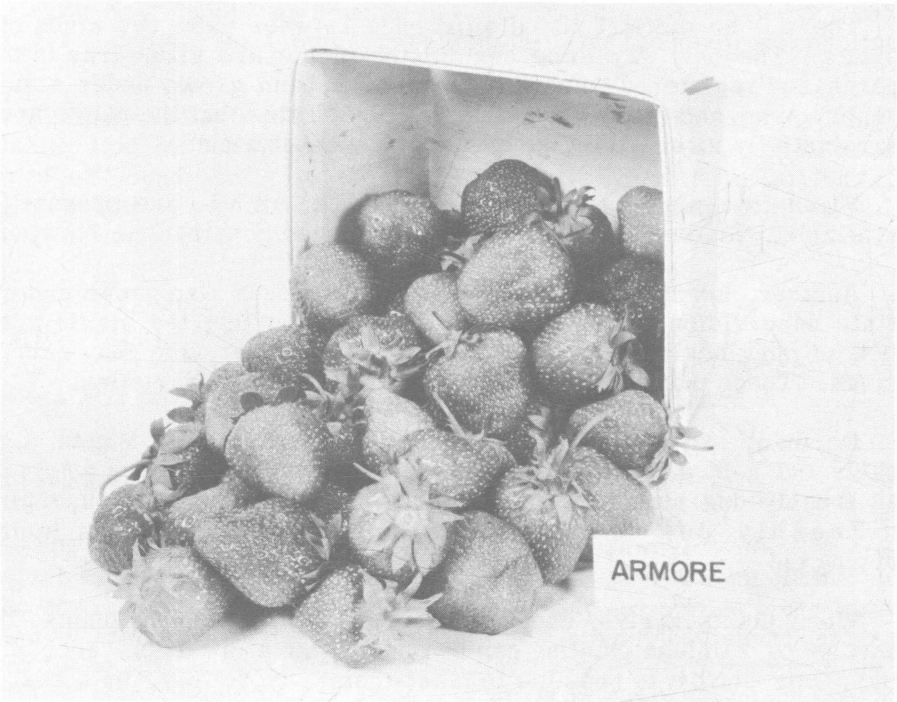
Everbearing Varieties

Everbearing varieties will produce one crop of berries during the normal June season and then, if properly handled, will produce a second crop during the late summer and early fall. The fall crop is usually terminated by frost. Successful culture of this type of berry is dependent upon the adoption of the sawdust-mulch spaced-plant system of culture described on page 14. There are no red stele resistant varieties of this type.

Selecting Varieties

There are a large number of varieties offered for sale. Although most varieties are highly recommended in the catalogues, only a few

are suitable for use in Ohio. Those varieties which have proved best for Ohio are listed in the table on page 9 with their characteristics. Since new varieties are continually being introduced, this list is subject to change.



Armore - one of the superior new varieties suited to Ohio. Good crops of these large fine quality berries can be produced in the home garden. Note that the cap and stems are picked with the berries.

Modern strawberry varieties are all self-fruitful and will produce when planted alone. It is generally best to plant several varieties, however, to extend the picking season.

Selection and Care of Plants

The selection of planting stock to establish the strawberry planting is of major importance. The disadvantages of poor stock can never be overcome. Planting stock is the keystone of the enterprise.

It is important to buy from a reputable nursery to be sure of getting good plants, true to name. To secure plants of the desired variety, place orders as early as possible. When placing an order, indicate the desired delivery date.

The best type of plant is one that is virus-free. Such virus-free plants usually yield 50 to 75 percent more than plants from ordinary planting stock. They are also more vigorous than conventional plants.

There is no distinct visual difference between these two kinds of plants. The only way to be certain the plants are virus-free is to purchase "registered" plants. These have been grown under state supervision, and the word, Registered, indicates that the plants are substantially virus-free, the best that can be obtained.

Virus-free plants of many varieties, but not all, are presently available. Growers should use them whenever possible.

Another class of plants, called "Certified," is also grown under state supervision. This certification indicates that the plants are free of most noxious diseases and insects; however, they may carry virus. These plants are the best available for many varieties.

Dormant strawberry plants are best for planting. Plants dug early and held dormant in storage, if properly stored, are as good as freshly-dug plants. In some cases, storage plants are superior to freshly-dug ones. Handle plants carefully to prevent their drying out.

When plants arrive, check the bundles and moisten the plants, if necessary. Unless planting can be done within a few days, "heel in" the plants until it is possible to plant them. To do this, dig a shallow trench, deep enough to accommodate the root system, in a sheltered area where the soil is well drained. Open the bundles and place a single layer of plants against one side of the trench, so the crowns are partially above the soil line. Cover the roots with soil and firm it carefully. Plants so handled can be held for several weeks, if they are not allowed to dry out. Do not leave plants heeled in any longer than absolutely necessary.

It is generally wiser and cheaper, in the long run, to purchase nursery stock than to secure planting stock from your own or your neighbor's plantings. The better the planting stock, the better the yields you can expect.

Site Preparation

Ideally, the proposed strawberry site should be used to grow a cultivated crop the season prior to planting. If, due to space limitations, it is necessary to plant an area that has been in sod, that sod should be plowed down the fall prior to planting.

If animal manures are available, they can be applied in the fall. A suitable application is 50 to 75 pounds per 100 square feet.

To assist in the control of erosion, seed the area to ordinary rye in early September, as soon as the crop is removed. Usually, two to three pounds per 1,000 square feet will give the desired results.

Prepare the site for planting as early as possible in the spring, during late March or early April. Work the soil until it is "near seedbed" condition. As the soil is prepared, work in fertilizer. On most sites a pound of 5-10-10 mixture per 100 square feet will be beneficial.

For convenience, the soil insecticide can be mixed with and spread with this fertilizer (See page 14). Do not work the soil when it is "wet." Soil worked in this condition may become puddled. This effect will be noticeable during the entire growing season.

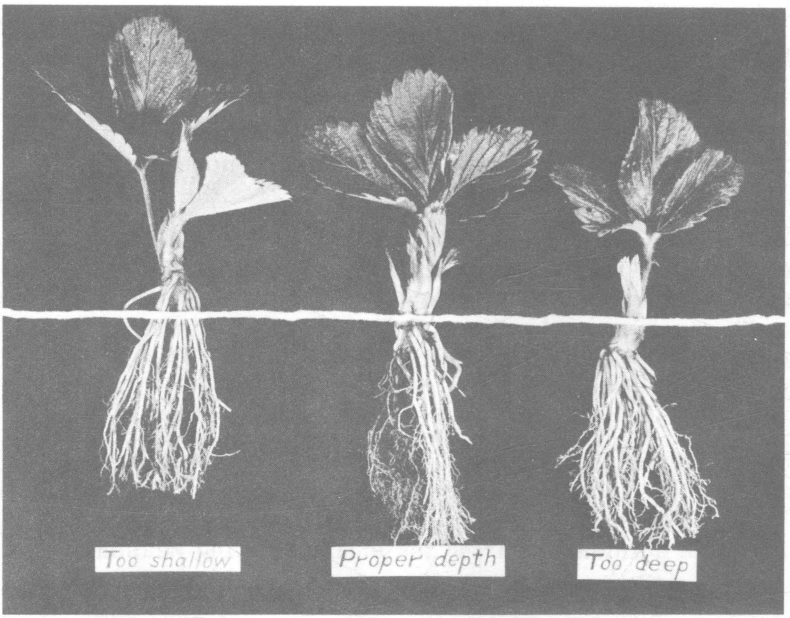
Making the Planting

The training system to be followed in the strawberry planting determines the distance between the rows and between the plants in the row. The majority of home gardeners use the matted row. With this system no effort is made to limit the number of runner plants, but these runner plants are kept within a row 18 to 24 inches wide. The plants are usually set 18 inches apart in rows 48 inches apart.

The other system is called the spaced row. In such plantings the number and location of runner plants is predetermined. For details of this system, see the section "Growing Everbearing Strawberries". The spaced row system requires much more care than the matted row.

Early spring planting is best. Plants should be set as soon as it is possible to prepare the site. Normally, this can be done during late March and early April. Do not attempt to plant until the soil is dry enough to work.

Prior to planting, remove all but two or three of the most vigorous leaves and prune away about one-third of the root system. Place the plants in the soil so the root system is spread out. Cover the roots until the crown (where the leaves arise) is level with the surface of the soil. If the crown is covered with soil, or the roots are exposed, the plants will do poorly and may die.



Depth of planting is important with strawberries. Plants set too shallow or too deep will not grow well and may die. Note the trimming that was done to the tops and roots.

Strawberry blossoms should be removed during the summer after planting. If plants are allowed to fruit the first year, it weakens them for heavy fruiting the second year. For everbearing varieties, blossoms can be left after July 1-15 for the fall crop.

Firm the plants carefully with your foot. After setting each plant, give it at least a cup of water. All flowers or flower stalks apparent at the time of planting should be removed.

Strawberry Varieties for Ohio

Variety	Season	Yield	Berry Size	Quality	Remarks
			June-Bearing Non-Red Stele Resistant		
Earlidawn	Very early	High	Large	Tart	Outstanding new variety.
Premier	Early	Medium	Medium	Medium	Standard commercial variety.
Pocahontas	Early	High	Large	Tart	Promising new variety.
Catskill	Midseason	High	Large	Medium	Good local market variety.
Empire	Midseason	Medium	Large	Medium	Dependable newer variety.
Fairfax	Midseason	Medium	Large	High	Good home garden variety.
Erie	Late	Very high	Medium	Medium low	Dependable newer variety.
Armore	Late	High	Large	High	Dependable new variety.
Tenn. Beauty	Late	High	Medium	Medium	Only for Southern Ohio.
Robinson	Late	Medium	Extra large	Low	Standard commercial variety.
			June-Bearing Red Stele Resistant		
Surecrop	Midseason	Very high	Large	Medium	Promising new variety.
Vermilion	Midseason	High	Medium	Medium	Good variety, may be soft.
Plentiful	Late	Very high	Large	Medium	Promising new variety.
Sparkle	Late	Very high	Medium	High	Good variety for freezing.
			Everbearing Non-Red Stele Resistant		
Brilliant	--	High	Medium	Tart	Patented variety.
Gem	--	Medium	Medium	Tart	Old standard variety.
Superfection	--	High	Medium	Tart	Most popular of everbearers.

Care the First Season

Flower stalks should be removed as they appear. If they are allowed to develop, plant growth of the next year's crop will be reduced.

Keep the planting carefully cultivated and hand hoed throughout the season. This must be done to control weed growth. In addition, this will help keep the runner plants within their assigned row area. It will also permit easier rooting of runner plants. Chemical weed control may be used to aid in weed control during this period.

Runner plants produced after August 15 are relatively unproductive, and unless the desired matted row has not been obtained, they may be removed.

There seldom is need for fertilizer applications during the growing season. If the plants appear light green and don't "grow-off-well" about a month after planting, however, fertilize the new plants with two tablespoonfuls per plant of a 16 percent nitrogen fertilizer or the equivalent. Spread the fertilizer around the plant, about three inches from the crown.

A similar application may be made about August 1, if the plants have light green leaves. This application may be broadcast over the row. When applying this fertilizer, select a dry day and brush all fertilizer off the leaves to protect them against fertilizer burn. Fertilizer applications in the spring of the fruiting year are apt to reduce yields. Be careful in applying fertilizer. Too much nitrogen will cause excessive growth and reduced yields.

Winter Care

The strawberry planting should be mulched for winter protection. Mulch protects the plants from severe cold and from heaving due to the alternate freezing and thawing of the soil.

The best mulching materials are clean, seed-free wheat or rye straw. Leaves and oat straw tend to pack and smother the plants. Coarser materials offer little protection. Sawdust may be used, but straw is preferable. It is best to expose the straw to the weather by placing it near the planting early in the fall, so weed seeds may germinate prior to the mulch application.

Mulch should be applied three to four inches deep over the plant rows. It should be applied only after the planting has experienced several sharp freezes--in the lower twenties. Usually in Ohio, this will be sometime between Thanksgiving and Christmas.

It is easier to apply mulch while the ground is frozen. Mulch applied before growth stops will cause the crowns to rot. If mulch application is delayed, the crowns could be damaged.

In the spring when growth starts (new leaves start to develop), fork the mulch off the plants and place it in the area between the rows. So placed, the mulch controls weed growth, conserves moisture and helps to keep the berries clean.

This mulch may also be used to protect the flowers from frost. If frost is predicted while the flowers are open, simply fork the mulch over the rows. It can be left in place for several days, if necessary. When removing mulch, it is best to remove only enough to let the plants develop.

The straw mulch is removed in spring and placed between the matted rows of strawberries. Here it helps to conserve soil moisture and suppresses weed growth and prevents dirt from splashing on the ripening fruit.

Harvesting

One of the many advantages of growing strawberries in the home garden is that they may be eaten at the peak of their quality. Berries should be picked when they are fully colored; those with white areas are not ripe. Pick the berries with the stems attached. To do this, snap the stem over your finger. Avoid mashing the berries. Keep harvested berries out of the sun and place them under refrigeration as soon as possible.

When possible, avoid picking the fruit when it is wet. Harvest as often as necessary, normally every other day. The harvest season can be extended by the planting of varieties that mature in sequence.

Renewing the Planting

Strawberries may be fruited more than one year. Yields and size of berries usually are progressively less the second and third years. It is unwise to attempt to obtain more than three crops from a single planting. Only good plantings should be maintained and renewed. Weak, weedy or diseased plantings should be destroyed right after harvest.

The renewal of a planting should be done shortly after harvest. Plow or spade out the middle and one side of the matted row. Leave a strip of plants about six inches wide. Fertilize this row with nitrogen as described on page 10. The renewed planting is then cared for in the same manner as a first year planting.

Strawberry blossoms, like these, are very susceptible to frost injury. They can be protected from light frosts by mulch. If frost is predicted while the berries are in bloom, fork the mulch back over the plants. It should be removed as soon as the danger of frost is over.

Unless some renewal practice is followed, the rows are apt to grow together and a dense mat of plants of little value will form. Many growers prefer to establish a new planting each spring rather than to follow any renewal practices.

Chemical Weed Control

Chemical weed control does not eliminate the weed problem. If properly used, it can make weed control easier without reducing either growth or yield. It is most effective during the growing season while the fruiting row is being formed. Although its use in large plantings should be considered, it is doubtful whether its use in small plantings is justified.

The recommended herbicide for use in strawberries is SES (Sesone). Good weed control will result in most plantings, if SES is applied at the rate of one ounce* in one or two gallons of water per 1000 square feet. It should be applied uniformly to the entire planting, to row and aisle area alike. It should only be applied following a careful hoeing that destroys all weed growth, when the soil is moist enough for weed seed germination.

After the herbicide is applied, the soil should not be disturbed until soil or weed conditions demand it. Repeat applications can be made, but four weeks should elapse between treatments, and hoeing should precede each treatment. No more than four treatments should be made per season. The first application should not be made until the plants are well established four to six weeks after planting. This herbicide kills germinating seeds and is not effective against established weeds.

At the rate suggested, SES is safe in strawberry plantings; however, careless use of this herbicide may result in injury to the strawberry and to other plants. It is suggested that growers experiment with its use in a small area before treating the entire planting.

Disease and Insect Problems

Strawberries are relatively free from disease and insect problems. Normally, they will produce satisfactory crops in the home garden without spraying. Some difficulties can be avoided by proper selection of site and planting stock and by following good cultural practices. Growers should, however, be aware of the following disease and insect problems and their solutions.

*Approximately 3-1/2 level tablespoons.

Red stele is a fungus disease which can cause serious losses throughout Ohio. It lives in the soil and attacks the root system in the spring of the fruiting year. It is most often found in low wet areas. Some infected plants suddenly wilt and die, while others become stunted and produce small worthless seedy berries. The new roots of these plants will have no laterals. If they are cut, the center, or stele, of the root will appear reddish-brown, while the stele of the healthy root is creamy white. Usually, only part of the planting will be infected.

Since there is no known method to control the disease, infected plantings should be destroyed. However, good crops of high quality berries may be grown on such sites if red stele resistant varieties are grown. Recommended resistant varieties are listed on page 9. Production of non-resistant varieties is not practical on infected sites.

Fruit rots can cause reduction in yield. To overcome this problem, spray the fruiting rows with Captan at weekly intervals from the time of bloom until the first berries are ready to pick. Use one ounce* of the commercial product in three gallons of spray. Force the spray under the leaves to assure coverage of the flowers and fruits.

Other fungus diseases that may appear on the leaves are Leaf Spot and Scorch. These diseases are seldom troublesome enough to cause concern. If they become severe, the above-mentioned Captan spray will control them.

The major insect pests are the white grubs which attack the crowns. It is because of these pests that strawberries should not be planted following sod. To avoid risk of grub damage, mix a soil insecticide into the soil prior to planting. Use either Aldrin or Dieldrin at the rate of one ounce per 1000 square feet or Chlordane at the rate of two and a half ounces per 1000 square feet. These rates apply to actual toxicants. It is easier to spread these insecticides when they are mixed in the fertilizer.

Other insect pests are not likely to be troublesome. If other pests do appear, see the current Extension Service control recommendations available from your county agent.

Growing Everbearing Varieties

Everbearing strawberries will produce satisfactorily, if they are grown under the spaced-plant sawdust-mulch system of culture. This method requires a great deal of labor; therefore, planting should be of limited size. This type of berry will not do well when grown in matted rows.

*Approximately 4-1/2 tablespoons.

This system of spacing plants may be used for June-bearing varieties as well. With June-bearing varieties sawdust is not needed; the plants should be mulched during winter with straw.

Set plants as indicated on page 7, 15 inches apart, in rows 42 inches apart. Care for the everbearing plants as if they were a regular planting until early June when runners appear. During this period, take special care to remove all blooms. When the runners begin to appear, stop cultivation. Fertilize each plant with two tablespoons of a 16 percent nitrogen carrier or the equivalent.

The entire area of the planting should then be covered with one inch of sawdust. Either hardwood or softwood sawdust may be used. This may be fresh or weathered. Sawdust does not make the soil acid; however, do not apply excessive amounts of it.

Everbearing strawberries growing under the sawdust-mulch spaced-plant system of culture.

Once the sawdust is applied, further weed control must be accomplished by pulling, because hoeing will mix the sawdust with the soil, and the mulch effect will be lost.

As soon as mulch is applied, start training the runner plants, locating them. One system of training consists of rooting three runner plants per plant, as indicated in the accompanying diagram. Thus, the original row becomes a triple row.

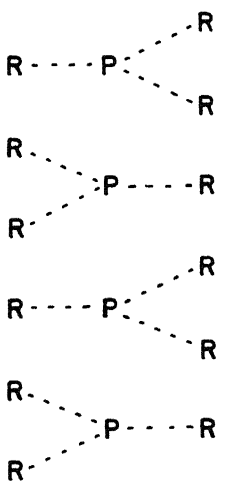
As the runner plants form, force them gently but firmly through the sawdust so their roots will be in contact with the soil. The distance between the rows of parent plants and runner plants will vary from season to season, but normally it will be about nine inches. There are many other possible arrangements.

After the desired number of runner plants has been established, all other runners and runner plants must be removed throughout the remainder of the season.

The removal of flowers should continue until the first or the middle of July. The exact date for discontinuing blossom removal depends upon the vigor of the plants. Ripe berries may be expected about a month after the bloom. The plants will produce ripe berries until frost.

The sawdust mulch gives adequate winter protection. If mulch has been lost during the growing season, a thin renewal layer may be needed prior to winter. Apply only enough to make a total depth of one inch.

The following year, the planting may be allowed to produce a spring crop. After the crop is completed, remove the bloom until mid-July to assure a fall crop. For the second season all runners should be removed except those needed to replace lost plants. No more than two seasons should be expected from a planting of everbearing berries.



One of the arrangements of parent (P) and runner (R) plants which is used in the production of everbearing strawberries